(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
10 May 2001 (10.05.2001)

PCT

(10) International Publication Number
WO 01/33874 A1

(51) International Patent Classification[7]: H04Q 7/24

(21) International Application Number: PCT/KR00/01239

(22) International Filing Date: 31 October 2000 (31.10.2000)

(25) Filing Language: Korean

(26) Publication Language: English

(30) Priority Data:
1999/48621 4 November 1999 (04.11.1999) KR

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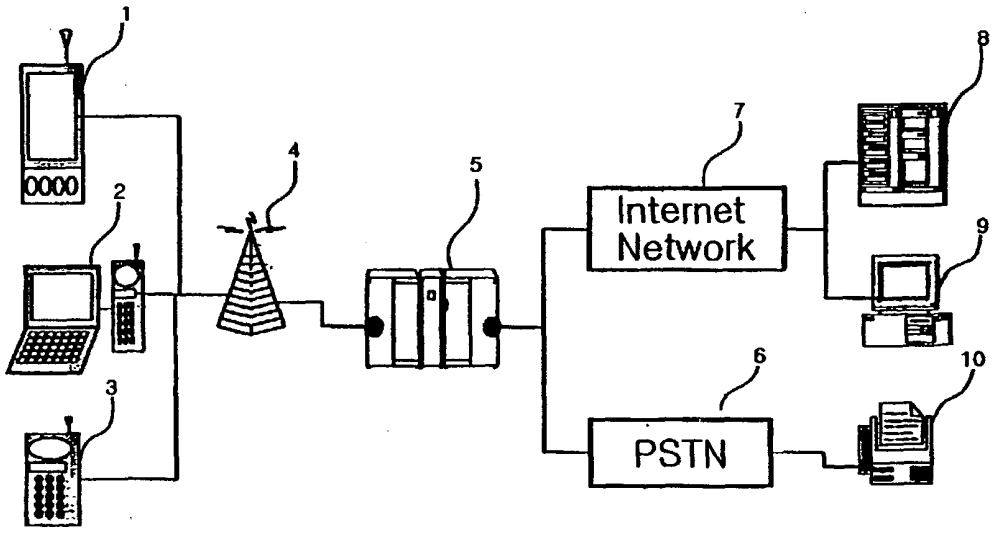
(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *With international search report.*
— *Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SYSTEM FOR A REMOTE FILE MANAGEMENT WITH MOBILE DEVICES



(57) Abstract: The remote file server according to the present invention includes: a compression manager for applying a compression algorithm to a requested file to form a new file or to furnish it to a compression-requested module; a distribution manager for transmitting the files of the remote file server by e-mail or by facsimile upon receiving a request; a format converter for converting the format of the files of the remote file server upon receiving a request; a storage manager for carrying out an interfacing or a WML (wireless markup language) service for the modules; and a file system of a basic operation system.

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SYSTEM FOR A REMOTE FILE MANAGEMENT WITH MOBILE DEVICES

Field of the Invention

The present invention relates to a remote file management system using a mobile device. More specifically, the present invention relates to a remote file management system using a mobile device, in which the communication speed problem of the wireless network is solved through compressed transmission and reception, the resource shortage problem of the terminal is overcome by referencing or distributing any kind of files in the terminal, and the file system of the general computers can be managed directly by means of the mobile device.

Background of the Invention

So far, there have been developed many kinds of information systems for managing files such as electronic documents, electronic library and information search system. However, there exists the disadvantage that most of the users have to register the file in the mentioned system, and have to learn the applied program for managing and referencing the registered files. Accordingly, the files are stored in a simple common file server or in his or her own personal computer in carrying out the management. Meanwhile, recently the wireless data servers using the mobile telephone networks are widely utilized, but this can handle only the record units or the character-based information, and therefore, the most important file information cannot be serviced under the wireless environment.

In the technical environmental aspect, the information terminal and the wireless communication environment will be described. In the field of the terminals, the universal mobile information devices such as PDA (personal digital assistant and HPC (hand held PC) are being briskly developed, and yet they are lagging behind

the PC in the performance such as CPU function, storage memory, and picture size) and in the functions such as data inputting method and multi-media processing function. In the aspect of the wireless communication environment, wireless data are being efficiently serviced because the data communication methods such as IS-95B/C(CDMA), GPRS (GSM) and CDPD have been put to the practice. However, they are inferior to the conventional wire networks in the expense, stability and speed.

The current file management system such as Unix and Windows are applied to the high performance computers which are mostly wire-connected. However, recently, mobile users are increased, and they are confronted with needs to manage the files of the high performance PC.

Therefore, the present inventor developed a remote file management system using a mobile device, in which the communication speed problem of the wireless network is solved through compressed transmission and reception, the resource shortage problem of the terminal is overcome by referencing or distributing any kind of files in the terminal, and the file system of the general computers can be managed directly by means of the mobile device, thereby making it possible to access the general files in a remote control manner.

Objects of the Invention

Therefore it is an object of the present invention to provide a remote file management system using a mobile device, in which the general file system of the conventional desktop computer can be managed and searched by means of a wireless device.

It is another object of the present invention to provide a remote file management system using a mobile device, in which the document type information of the desktop computer can be accessed or managed in a simple manner without carrying out a large scale operation.

It is still another object of the present invention to provide a remote file

management system using a mobile device, in which the transmission is carried out in a compressed form, thereby solving the slow transmission speed problem of the wireless network.

It is still another object of the present invention to provide a remote file management system using a mobile device, in which the information of the desktop computer is transmitted to the mobile device after converting the data to the standard form such as PDF, HTML, TIFF and JPEG, and therefore, once the relevant application program is installed in the mobile device, then all kinds of files can be viewed in the mobile device.

In achieving the above objects, the remote file management system using a mobile device according to the present invention includes: a remote file server for storing and transmitting files of a user; the mobile device remotely managing the files of the remote file server; a communication network for connecting the remote file server to the mobile device so as to transmit data; and a distributor for receiving the files by a remote management of the user.

The remote file server according to the present invention includes: a compression manager for applying a compression algorithm to a requested file to form a new file or to furnish it to a compression-requested module; a distribution manager for transmitting the files of the remote file server by e-mail or by facsimile upon receiving a request; a format converter for converting the format of the files of the remote file server upon receiving a request; a storage manager for carrying out an interfacing or a WML (wireless markup language) service for the modules; and a file system of a basic operation system.

The mobile device according to the present invention includes: a searching module for searching directories and files of the remote file server; a file viewing module for viewing the files received from the remote file server; and a compression module for expanding or compressing the files of the remote file server after or before reception or transmission of them.

Brief Description of the Drawings

The above objects and other advantages of the present invention will become more apparent by describing in detail the preferred embodiment of the present invention with reference to the attached drawings in which:

FIG. 1 schematically illustrates the constitution of the remote file management system according to the present invention;

FIG. 2 schematically illustrates the major constituents of the remote file management system according to the present invention;

FIG. 3 illustrates a list of the executions of the search module in the mobile information terminal according to the present invention;

FIG. 4 illustrates examples of the execution results of the search module of the mobile telephone receiver according to the present invention;

FIG. 5 illustrates a file and directory search list in the mobile telephone receiver according to the present invention; and

FIG. 6 illustrates the data flow through the constituents of the remote file management system according to the present invention.

Detailed Description of the Invention

The management environment according to the present invention includes: four parts, i.e., a mobile device, a communication network, a remote file server and a distributor. This management environment according to the present invention will be described referring to FIG. 1. FIG. 1 schematically illustrates the constitution of the remote file management system according to the present invention.

The mobile device which is used by the user for remotely managing the files includes: mobile information terminals 1 and 2 having a universal data processing function and a wireless communication function; and a mobile telephone receiver 3 having a main function of vocal talks and also having a wireless data processing function such as WAP (wireless application protocol) and SMS (short message service).

That is, the mobile information terminals according to the present invention

include: a wireless PDA 1 with a universal operating system such as Windows, CE, EPOC, LINUX, Palm OS and the like mounted thereon, and with a wireless communication module internally installed therein; and a portable mobile information terminal 2, this being formed by coupling a wireless communication module to the general portable information terminal such as PDA, HPC or the like.

The mobile telephone 3 includes: a smart phone or a WAP phone capable of data-servicing only for short sentences such as SMA or WAP.

The communication network consists of: a wireless communication network such as a wireless data network 4 and a wireless data gateway 5, and a wire communication network such as a wire internet network 7 and PSTN network 6. The wireless data network 4 directly communicates with the mobile information terminal and the mobile telephone receiver. The wireless data gateway 5 connects the wireless communication network and the wire communication network together.

The remote file server 8 is a general computer with the windows universal operating system or the Unix universal operating system installed therein. Further, the remote file server 8 is connected to a wire communication network, so that the user can store and manage the files.

The distributor is a device for receiving the contents of the remote file server 8. The distributor includes: an e-mail server 9 and a facsimile device 10. Thus the user can transmit the files of the remote file server 8 through mail or facsimile.

The software for carrying out the present invention includes: a server module 201, a mobile information terminal module 207 and a mobile telephone module 211. This will be described referring to FIG. 2. FIG. 2 schematically illustrates the major constituents of the remote file management system according to the present invention.

The server module 201 is installed in the remote file server 8 which has an operating system of the universally used windows series such as Windows NT, Windows 2000, Windows ME, Windows 98 and the like, and the Unix series such as Solaris, AIX, HP and the like. The server module 201 processes client requests for the files of the file system of the basic operation system. The server module 201

includes: a compression manager 202, a distribution manager 203, a format converter 204, a storage manager 205, and a basic operation file system 206.

The compression manager 202 compresses the files requested by the mobile information terminal module 207, by applying a universal compression algorithm such as LWZ, GIF, JPEG, group III or the like, thereby forming a new file so as to furnish the compressed file to the requestor.

The distribution manager 203 carries out the function of transmitting the files of the remote file server 8 through e-mail or facsimile in accordance with the request by the search module 208 of the mobile information terminal module 107. In the case where the distribution is carried out through e-mail, the file of the remote file server 8 is transmitted through SMTP, exchange or notes mail in the form of an attached document. In the case where a compressed file is transmitted, the file is compressed and transmitted by the compression manager 202. In the case where a format conversion is required, the conversion is carried out by the format converter 204 before being transmitted. In the case where the file is transmitted through facsimile, the file is converted into a facsimile format such as group III 20 or group VI by the format converter 204, and then is transferred through the PSTN network 6 to the facsimile device 10.

The format converter 204 carries out the function of converting the format of the files of the remote file server 8 in accordance with the request by the user. Under this condition, the file format before the conversion is called "primitive file format", while the format after the conversion is called "target file format".

The primitive file format includes all kinds of file formats such as MS office (Word, Excel, Power Point), ASCII Text, TIFF, GIF, JPEG, PDF, HTML, HWP and the like. The target file format includes: PDF (portable data format), HTML, JPEG, GIF, TIFF, FAX, BMP and the like.

The storage manager 205 furnishes an interface between the file system 206 of the basic operation system (with the server module 201 installed therein) and the server module 201 which includes the compression manager, the distribution manager and the format converter. The storage manager 205 further carries out the

function of processing the requested items of the file system 206 of the basic operation system such as viewing the directory list and file list, file deletion, name change and the like. Particularly, the storage manager 205 carries out the function of servicing the request execution of the mobile telephone module 211 in the form of WML format.

The file system 206 of the basic operation system indicates the basic file system such as Unix or Windows. In the present invention, the file system 206 of the basic operation system carries out the function of executing and distributing the requested items of the user without developing a separate file system.

The mobile information terminal module 207 is indicated by reference codes 1 and 2 in FIG. 1. These are installed in PDA, HPC, or a mini-note book PC in which the universal mobile information terminal operating system is installed as described above. The mobile information terminal module 207 includes: a search module 208, a file viewing module 209, and a compressing module 210.

The search module 208 is a program which is used directly on the screen and which carries out a function same as that of the Windows searcher. The principal functions of the search module 208 are to view the directory structure of the file system of the remote file server 8, to view the file list of a particular directory, and to manage the files and the directories.

The file system directory structure viewing makes it possible to view the structure levels of the directories of the server in the form of a tree like the Windows searcher. An example is a directory structure 31 of FIG. 3. In the file list viewing for viewing the files which belong to a particular directory of the file system, if a particular directory is selected like in the windows searcher, then the relevant file list belonging to the selected directory can be viewed. An example of this is a file list 32 of FIG. 3. The management functions for the files include: deletion, name change, registered information viewing /changing, copy, move, file viewing, transmission (by e-mail or facsimile), file downloading, file uploading and the like. The management functions for the directories include: deletion, name change, registered information viewing/ changing, copy, move, formation of new directory and the like.

The file viewing module 209 is a program for viewing the contents of the file of the remote file server 8 through the mobile information terminals 1 and 2. This module consists of programs of viewing the files of the general industrial standard. The examples of the programs include: PDF (portable document format), TIFF (tagged image file format), HTML (hyper text markup language), JPEG and GIF.

The compressing module 210 is used for expanding a compressed file in the case where a file from the remote file server 8 has been compressed, and is used for compressing a file in the case where the file is to be transmitted after compressing. A compressing algorithm includes: LWZ, GIF, group III, group VI, FAX compression algorithms.

The mobile telephone receiver module 211 indicates a Micro-browser for supporting a WML (wireless markup language) and an m-HTML (mobile HTML). The remote file management functions of the mobile telephone receiver module 211 include: a function of searching the directory and file lists of the remote file server 8, a function of managing the directories, a function of managing the files, and a function of transmitting the files.

The function of searching the directory and file lists of the remote file server 8 is carried out in such a manner that the level structured list of the directory of the remote file server 8 is searched, and that a file list belonging to the particular directory is searched. The directory management function includes: formation of new directory, deletion, name change, registered information viewing/ changing, move and the like. The file management function includes: file deletion, registered information viewing/ changing, move, name change and the like. The file transmitting function includes a transmission by e-mail, and a transmission by facsimile.

Now the operating principles of the remote file management system according to the present invention will be described referring to FIG. 6.

A command and a data are transmitted from the mobile information terminal module 207 to the server module 201. The kinds of the command and data are shown in Table 1 below.

Table 1

Kind	Description	Remarks
Directory search	A list of son directory list of a particular directory of server is searched.	
File list search	A file list of a particular directory of server is searched.	
Managing commands	Commands related to directories and files of server (delete, name change, information change, move, formation of new directory, viewing a registered information).	
Compress command	Particular file is compressed to form a new file.	The existing file is left intact.
Format conversion	A file is converted to a commanded format (HTML, PDF, TIFF, GIF, FAX) to form a new file.	The existing file is left intact.
Transmit command	A file is transmitted by e-mail or facsimile.	
File uploading	File is copied from terminal to particular directory of server.	File is sent.
File downloading	File is received from server to terminal.	
Viewing	File is viewed at terminal after downloading it.	

The server module 201 transmits an execution result status and a data to the mobile information terminal module 207 in a response to the request of the mobile information terminal module 207 (step 602). The execution result status and the data are summarized in Table 2 below.

Table 2

Kind	Description	Remarks
Execution	Execution status is transmitted (compression, transmission, deletion)	
Result	Requested execution result and data are transmitted in the case of downloading or list search.	

In response to the request (for file compression, format conversion, information change, deletion, and name change) for which the service of the existing operation file system 206 is required among the requests of the mobile information terminal module 207, the storage manager 605 transmits commands and data for the functions of the file system 206 (step 603). The file system 206 transmits the execution status (such as failure or success) and the processed data (such as file contents and list) in response to the request of the storage manager 205 (step 604). The compression manager 202 transmits the compression execution result to the storage manager 205 after executing the request of the mobile information terminal module 207 or the mobile telephone module 211 (step 605). The storage manager 205 transmits a command for compression to the compression manager 202 in response to the request by the mobile information terminal module 207 or by the mobile telephone module 211 (step 606). The storage manager 205 transmits commands for e-mail or facsimile transmission to the distribution manager 203 (step

607). The distribution manager 203 transmits the distribution execution result status (such as failure or success) to the storage manager 205 (step 608). The storage manager 205 transmits a command for a format conversion to the format converter 204 (step 609). The format converter 204 transmits the execution result status such as failure or success to the storage manager 205 (step 610). If the mobile information terminal module 207 or the mobile telephone module 211 has requested for a compression of a file and its mail/fax delivery, then the distribution manager 203 can directly request so to the compression manager 202, and can receive the execution result (step 611). If a format conversion and a mail/fax delivery are requested, the distribution manager 203 can directly request so to the format converter 204, and can receive the execution result status (step 612). If the relevant file has been compressed, or if a file is to be compressed before transmission to the remote file server 8, then the search module 208 of the mobile information terminal module 207 requests to the compression module 210 to make the relevant file compressed or expanded (step 613). Then the file is transferred to the external file viewing module 19 (PDF, TIFF, JPEG, HTML) so that the file from the remote file server 8 can be directly viewed at the mobile information terminal (step 614). Then the user interface and the execution result are transmitted to the WML type or m-HTML type document which has been received from the storage manager 205 (step 616). Then a request command of the search module 212 of the mobile telephone module 211 is transmitted (step 617). The principal commands are summarized in Table 3 below.

Table 3

Kind	Description	Remarks
Directory search	List of son directory of a directory of server is searched.	
File list search	File list of a directory of server is searched.	
Managing commands	Commands related to management for files and directories of server (delete, name, change, information change, move, formation of new directory, viewing the registered information).	
Compress commands	A file is compressed into a new file.	Existing file is left intact.
Format convert	A file is converted to another format (HTML, PDF, TIFF, GIF, FAX) to form a new file.	Existing file is left intact.
Transmit	A file is transmitted by e-mail or fax.	

The execution procedures for the above functions will be described referring to FIG. 6.

The search module 208 of the mobile information terminal module 207 sends a command for a directory search or a file search to the server module 201 (step 601). The storage manager 205 of the server module 201 passes this command to the file system 206 of the basic operation system (step 603). The file system 206 of the basic operation system sends the command execution result to the storage manager 205 (step 604). The storage manager 205 sends the compression result of the

compression manager 202 to the search module 208 of the mobile information terminal module 207 (step 602). The search module 208 requests to the compression module 210 to expand the compression, and outputs the search result to the screen as shown in FIG. 3.

The storage manager 205 presents an initial interface for WML (wireless markup language) or m-HTML, and if the user requests for a file list or for a directory list, then the storage manager 205 outputs the requested one to the mobile telephone receiver in the form of WML or m-HTML.

In the file conversion (such as format conversion and compression), the search module 208 of the mobile information terminal module 207 sends a format conversion and compression command to the server module 201 (step 601). The storage manager 205 of the server module 201 receives the relevant file by requesting it to the file system 206 of the basic operation system to send it to the compression manager 202 or to the format converter 204 (step 606 and step 609). The above result is transmitted to the file system 206 of the basic operation system, and sends the final result to the mobile information terminal module 207 (step 602).

The storage manager 205 presents an initial interface for WML (wireless markup language) or m-HTML, and the user requests for a file compression or a format conversion (step 616). The storage manager 205 of the server module 201 passes this command to the file system 206 of the basic operation system to receive the relevant file so as to send the file to the compression manager 202 or to the format converter 204 (steps 606 and 609). The result is transmitted to the file system of the basic operation system, and the final result is transmitted to the mobile telephone module 211 (step 617).

In the file distribution operation (mail or fax transmission), the search module 208 of the mobile information terminal module 207 sends a file distribution command (mail or fax transmission) (step 601). The storage manager 205 of the server module 201 passes this command to the file system 206 of the basic operation system to receive the relevant file so as to send the file to the compression manager 202 or to the format converter 204 (steps 606 and 609). The storage manager 205

receives the compressed or fax-converted file to transmit it by mail or by fax.

Further, the storage manager 205 presents an initial interface for WML (wireless markup language) or m-HTML, and the user requests for a file distribution such as e-mail or facsimile (step 616). The storage manager 205 of the server module 201 passes this command to the file system 206 of the basic operation system (step 603) to receive the relevant file so as to send the file to the compression manager 202 or to the format converter 204 (steps 606 and 609). The storage manager 205 receives the compressed or fax-converted file to transmit it by mail or by facsimile.

In the file and directory management operations such as deletion, copy, move and registered information change, the search module 208 of the mobile information terminal module 207 sends a file managing command (such as deletion, copy, move, or registered information change) (step 601). The storage manager 205 of the server module 201 passes this command to the file system 206 of the basic operation system (step 603). The file system 206 of the basic operation system executes the command, and sends the execution result to the storage manager 205 (step 604). The storage manager 205 sends the result to the search module 208 (step 602).
Further, the storage manager 205 presents an initial interface for WML (wireless markup language) or m-HTML, and the user sends a file managing command (such as deletion, copy, move, or registered information change) (step 607). The storage manager 205 of the server module 201 passes this command to the file system 206 of the basic operation system (step 603). The file system 206 of the basic operation system executes the command, and sends the execution result to the storage manager 205 (step 604). The storage manager 205 sends the result to the search module 208 (step 616).

The file content viewing function is supported only in the mobile information terminal module 207 and not in the mobile telephone module 211. In the file content viewing function, the search module 208 of the mobile information terminal module 207 sends a file viewing command to the server module 201 (step 601). The storage manager 205 of the server module 201 sends this command to the

file system 206 of the basic operation system (step 603). The file system 206 of the basic operation system executes this command, and sends the execution result or the file content to the storage manager 205 (step 604). The storage manager 205 carries out the compression or the format conversion in accordance with the command, and sends the execution result to the search module 208 (step 602). The search module 208 sends the received result to the file viewing module 209 (step 614). The file viewing module 209 outputs the relevant contents to the screen. In this procedure, if the received contents have been compressed, the search module 208 requests to the compression module 210 to expand the file (step 613) and to receive an expanded file (step 615), and sends the expanded file to the file viewing module 209 (step 614).

The file uploading function is supported only in the mobile information terminal module 207 and not in the mobile telephone module 211. In the file uploading function, the search module 208 of the mobile information terminal module 207 sends a file uploading command to the server module 201 (step 601). In this process, if the user requests, the search module 208 requests to the compression module to compress the file, and sends the compressed file to the server module 201 (step 601). The storage manager 205 of the server module 201 sends this command to the compression manager 202 to release the compression so as to send the expanded file to the file system 206 of the basic operation system (step 603). The file system 206 of the basic operation system executes the command, and sends the result to the storage manager 205 (step 604). The storage manager 205 transmits the result to the search module 208 (step 602).

According to the present invention as described above, the general file system of the desktop computer can be managed or searched directly by means of a mobile terminal. The document type files of the desktop computer can be managed or accessed by a mobile terminal at any time or at any place. Because the file is transmitted in a compressed form, the conventional low transmission speed problem can be solved. Further, the file of the desktop computer can be transmitted after converting it to a standard format (PDF, HTML, TIFF, JPEG), and therefore, if a

program for this standard format is installed in the mobile terminal, then all kinds of files of the desktop computer can be viewed by means of the mobile terminal.

In the above, the present invention was described based on the specific preferred embodiment and the attached drawings, but it should be apparent to those ordinarily skilled in the art that various changes and modifications can be added without departing from the spirit and scope of the present invention which will be defined in the appended claims.

What is claimed is:

1. A remote file management system using a mobile device, comprising:

remote file server for storing and transmitting files of a user;

said mobile device remotely managing the files of said remote file server;

a communication network for connecting said remote file server to said mobile device so as to transmit data; and

a distributor for receiving the files by a remote management of the user.

2. The remote file management system as claimed in claim 1, wherein said remote file server comprises:

a compression manager for applying a compression algorithm to a requested file to form a new file or to furnish it to a compression-requested module;

a distribution manager for transmitting the files of said remote file server by e-mail or by facsimile upon receiving a request;

a format converter for converting a format of the files of said remote file server upon receiving a request;

a storage manager for carrying out an interfacing or a WML (wireless markup language) service for said modules; and

a file system of a basic operation system.

3. The remote file management system as claimed in claim 1, wherein said mobile device comprises:

a searching module for searching directories and files of said remote file server;

a file viewing module for viewing the files received from said remote file server; and

a compression module for expanding or compressing the files of said remote file server after or before reception or transmission of them.

4. The remote file management system as claimed in claim 1, wherein said distributor is an e-mail server connected through said remote file server and an Internet network.

5. The remote file management system as claimed in claim 1, wherein said distributor is a facsimile machine connected through said remote file server and a PSTN network.

6. The remote file management system as claimed in claim 1, wherein a file system of a basic operation system (Unix series and Windows series) of said remote file server (connected in a wireless form) is managed by means of a mobile device (PDA, HPC, Smart Phone, or WAP Phone).

7. The remote file management system as claimed in claim 6, wherein a directory level structure of said file system of said remote file server is displayed on a screen of said mobile device in a form of a level structure.

8. The remote file management system as claimed in claim 6, wherein a file list belonging to a particular directory of said file system of said remote file server is displayed on a screen of said mobile device in a form of a list when it is transmitted to said mobile device.

9. The remote file management system as claimed in any one of claims 6 and 8, wherein a directory level structure and a file list belonging to a particular directory of said file system of said remote file server are transmitted after compressing them when transmitting them to said mobile device.

10. The remote file management system as claimed in claim 6, wherein when transmitting a file from said remote file server to said mobile device or from said mobile device to said remote file server, the file is transmitted after being

compressed to reduce the transmission amount.

11. The remote file management system as claimed in claim 6, wherein when transmitting a file from said remote file server to said mobile device, the file is converted to a format processable by said mobile device.

12. The remote file management system as claimed in claim 6, wherein any particular file of said file system of said basic operation system can be transmitted by e-mail by utilizing a mobile information terminal or a mobile telephone receiver.

13. The remote file management system as claimed in claim 12, wherein when transmitting any particular file of said file system of said basic operation system by e-mail by utilizing a mobile information terminal or a mobile telephone receiver, the file is compressed in advance.

14. The remote file management system as claimed in claim 12, wherein when transmitting any particular file of said file system of said basic operation system by e-mail by utilizing a mobile information terminal or a mobile telephone receiver, the file is converted to a format processable by a receiving party.

15. The remote file management system as claimed in claim 6, wherein when transmitting a file from the file system of said remote file server through said mobile information terminal or said mobile telephone receiver, the file can be delivered by facsimile.

16. The remote file management system as claimed in claim 6, wherein a directory of the file system of said remote file server can be deleted, name-changed, registered-information-changed, moved, or copied by using said mobile information terminal or said mobile telephone receiver at a remote distance.

17. The remote file management system as claimed in claim 6, wherein a file of the file system of said remote file server can be deleted, name-changed, registered-information-changed, moved, or copied by using said mobile information terminal or said mobile telephone receiver at a remote distance.

18. The remote file management system as claimed in claim 6, wherein a file of the file system of said remote file server can be compressed into a new file by using said mobile information terminal or said mobile telephone receiver at a remote distance.

19. The remote file management system as claimed in claim 6, wherein a file of the file system of said remote file server can be format-converted into a new file by using said mobile information terminal or said mobile telephone receiver at a remote distance.

20. The remote file management system as claimed in claim 6, wherein a file of said mobile information terminal can be copied into a particular directory of the file system of said remote file server.

21. The remote file management system as claimed in claim 20, wherein when copying a file of said mobile information terminal into a particular directory of the file system of said remote file server, the file is compressed to reduce the transmission amount, and when storing the received compressed file, the compressed file is expanded.

22. The remote file management system as claimed in claim 20, wherein when copying a file of said mobile information terminal into a particular directory of the file system of said remote file server, the file is compressed to reduce the transmission amount, and said file system of said basic operation system has a function of storing a compressed file.

Fig. 1

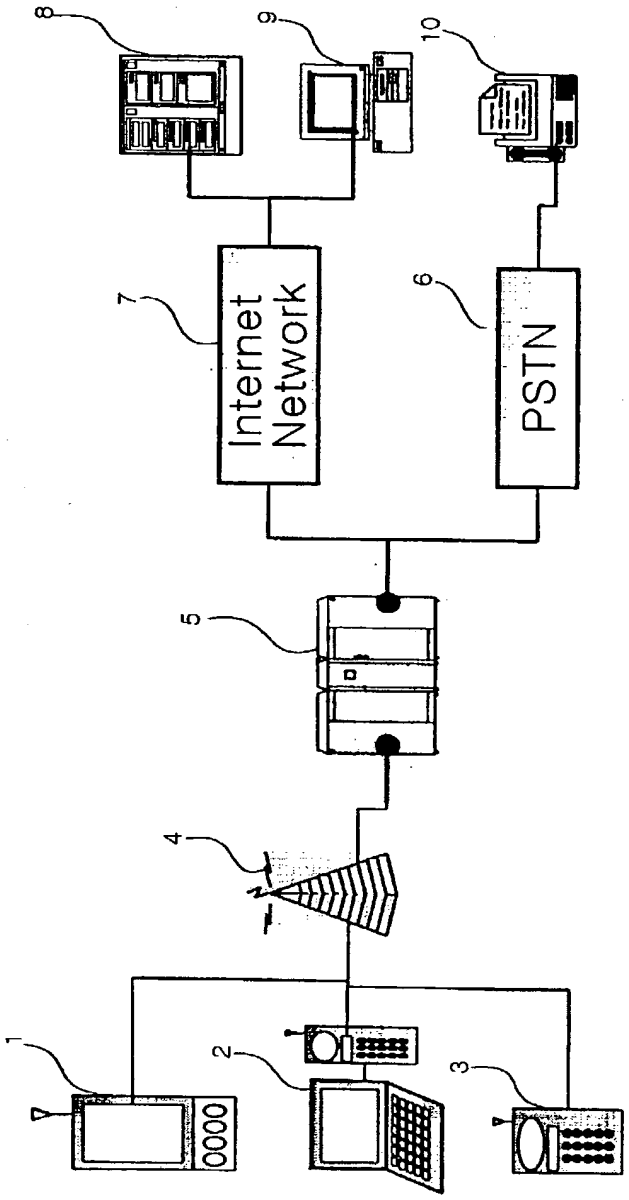


Fig. 2

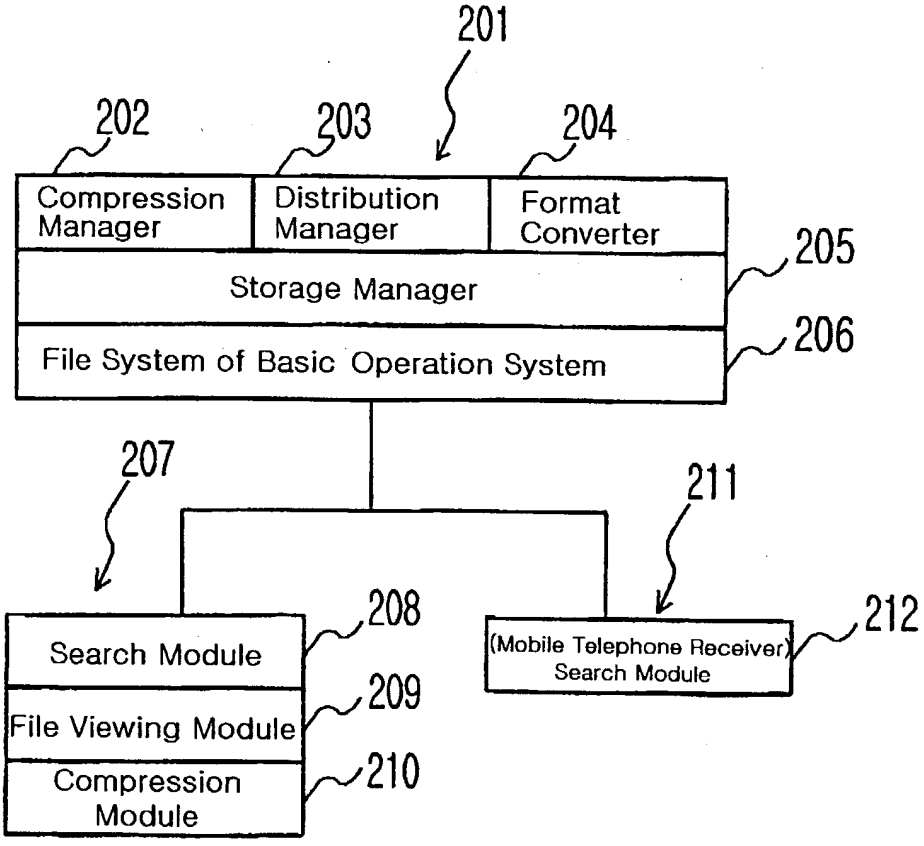
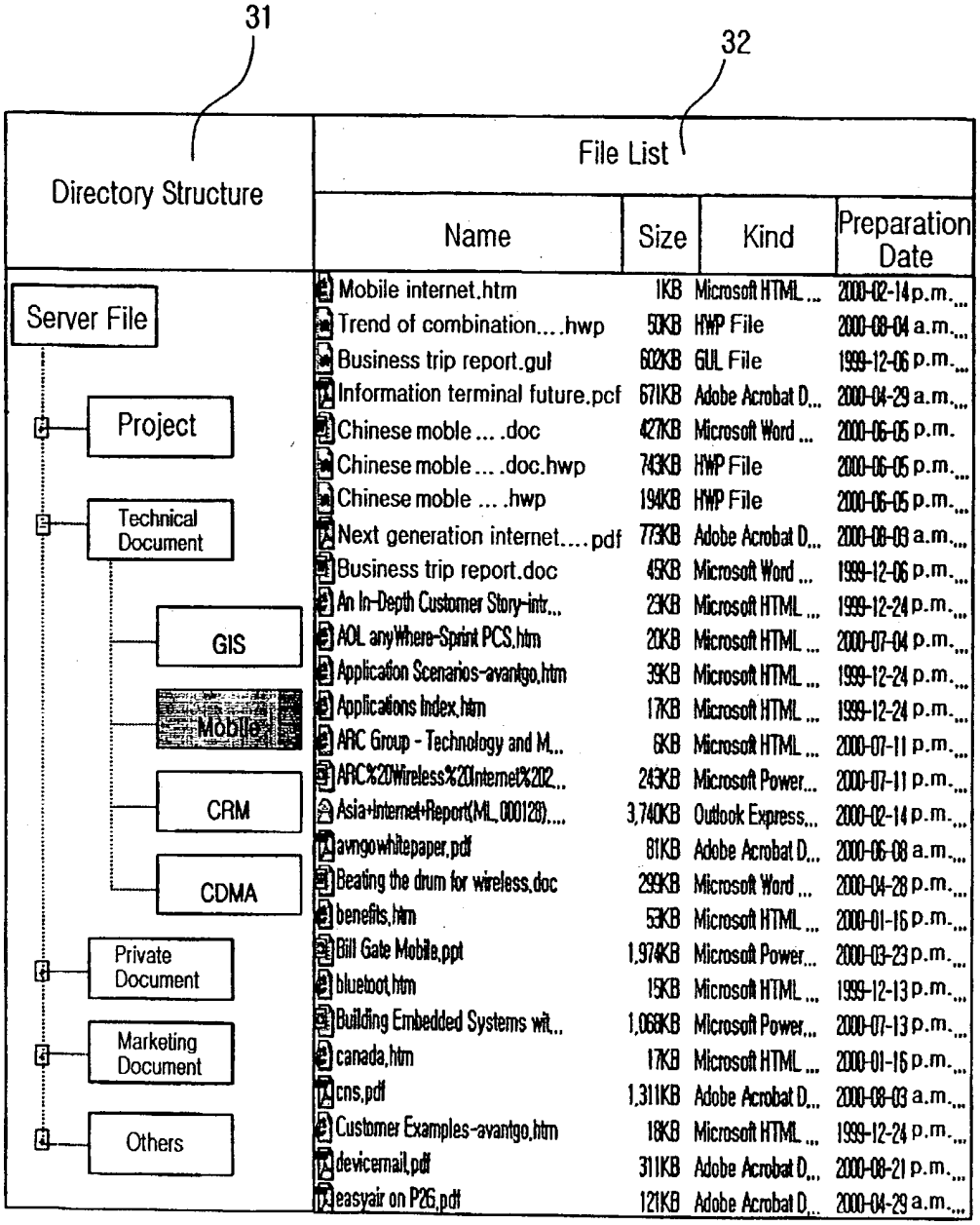

201
202
203
204
Compression Manager
Distribution Manager
Format Converter
205
Storage Manager
206
File System of Basic Operation System
207
211
208
Search Module
209
File Viewing Module
210
Compression Module
(Mobile Telephone Receiver) Search Module
212

Fig. 3


31
32
Directory Structure
File List
Name
Size
Kind
Preparation Date
Server File
Project
Technical Document
GIS
Mobile
CRM
CDMA
Private Document
Marketing Document
Others
Mobile internet.htm 1KB Microsoft HTML ... 2000-02-14 p.m.
Trend of combination....hwp 50KB HWP File 2000-08-04 a.m.
Business trip report.gul 602KB GUL File 1999-12-06 p.m.
Information terminal future.pcf 671KB Adobe Acrobat D... 2000-04-29 a.m.
Chinese moble .... .doc 427KB Microsoft Word ... 2000-06-05 p.m.
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Chinese moble .... .hwp 194KB HWP File 2000-06-05 p.m.
Next generation internet.... pdf 773KB Adobe Acrobat D... 2000-08-03 a.m.
Business trip report.doc 45KB Microsoft Word ... 1999-12-06 p.m.
An In-Depth Customer Story-intr... 23KB Microsoft HTML ... 1999-12-24 p.m.
AOL anyWhere-Sprint PCS.htm 20KB Microsoft HTML ... 2000-07-04 p.m.
Application Scenarios-avantgo.htm 39KB Microsoft HTML ... 1999-12-24 p.m.
Applications Index.htm 17KB Microsoft HTML ... 1999-12-24 p.m.
ARC Group - Technology and M... 6KB Microsoft HTML ... 2000-07-11 p.m.
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avngowhitepaper.pdf 81KB Adobe Acrobat D... 2000-06-08 a.m.
Beating the drum for wireless.doc 299KB Microsoft Word ... 2000-04-28 p.m.
benefits.htm 53KB Microsoft HTML ... 2000-01-16 p.m.
Bill Gate Mobile.ppt 1,974KB Microsoft Power... 2000-03-23 p.m.
bluetoot.htm 15KB Microsoft HTML ... 1999-12-13 p.m.
Building Embedded Systems wit... 1,068KB Microsoft Power... 2000-07-13 p.m.
canada.htm 17KB Microsoft HTML ... 2000-01-16 p.m.
cns.pdf 1,311KB Adobe Acrobat D... 2000-08-03 a.m.
Customer Examples-avantgo.htm 18KB Microsoft HTML ... 1999-12-24 p.m.
devicemail.pdf 311KB Adobe Acrobat D... 2000-08-21 p.m.
easyair on P26.pdf 121KB Adobe Acrobat D... 2000-04-29 a.m.

Fig. 4

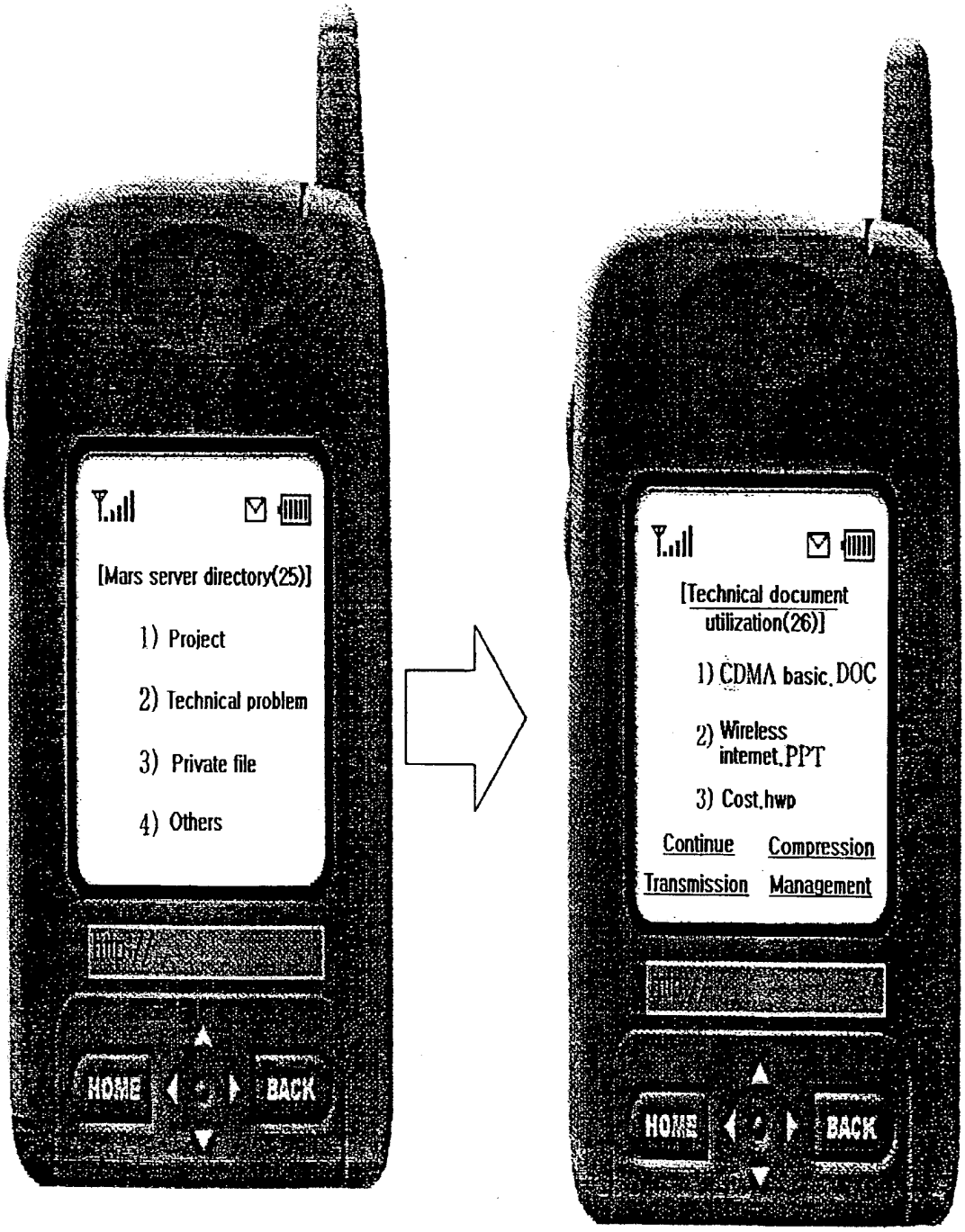
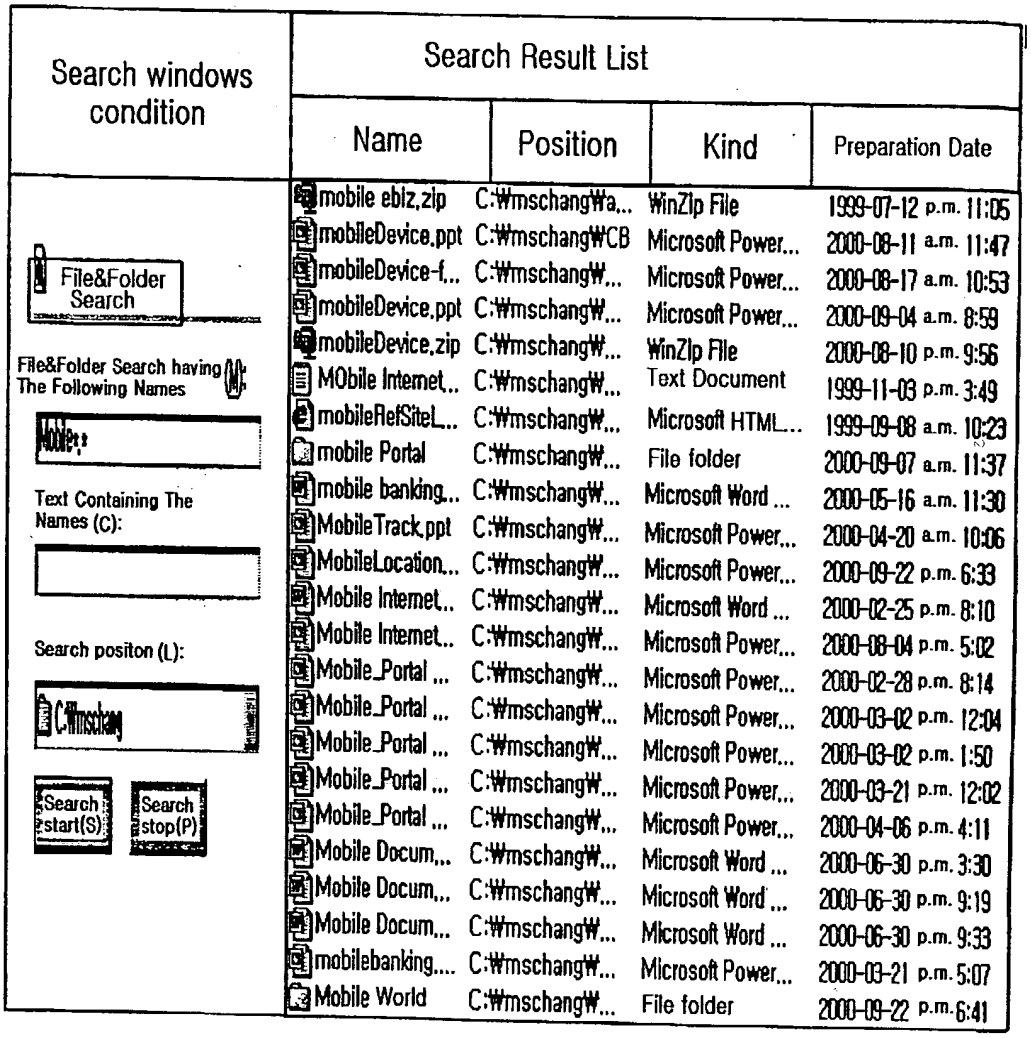

[Mars server directory(25)]
1) Project
2) Technical problem
3) Private file
4) Others
HOME
BACK
[Technical document utilization(26)]
1) CDMA basic.DOC
2) Wireless internet.PPT
3) Cost.hwp
Continue
Compression
Transmission
Management
HOME
BACK

Fig. 5


Search windows condition
File&Folder Search
File&Folder Search having The Following Names
Text Containing The Names (C):
Search positon (L):
C:₩mschang
Search start(S)
Search stop(P)
Search Result List
Name
Position
Kind
Preparation Date
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MobileTrack.ppt C:₩mschang₩... Microsoft Power... 2000-04-20 a.m. 10:06
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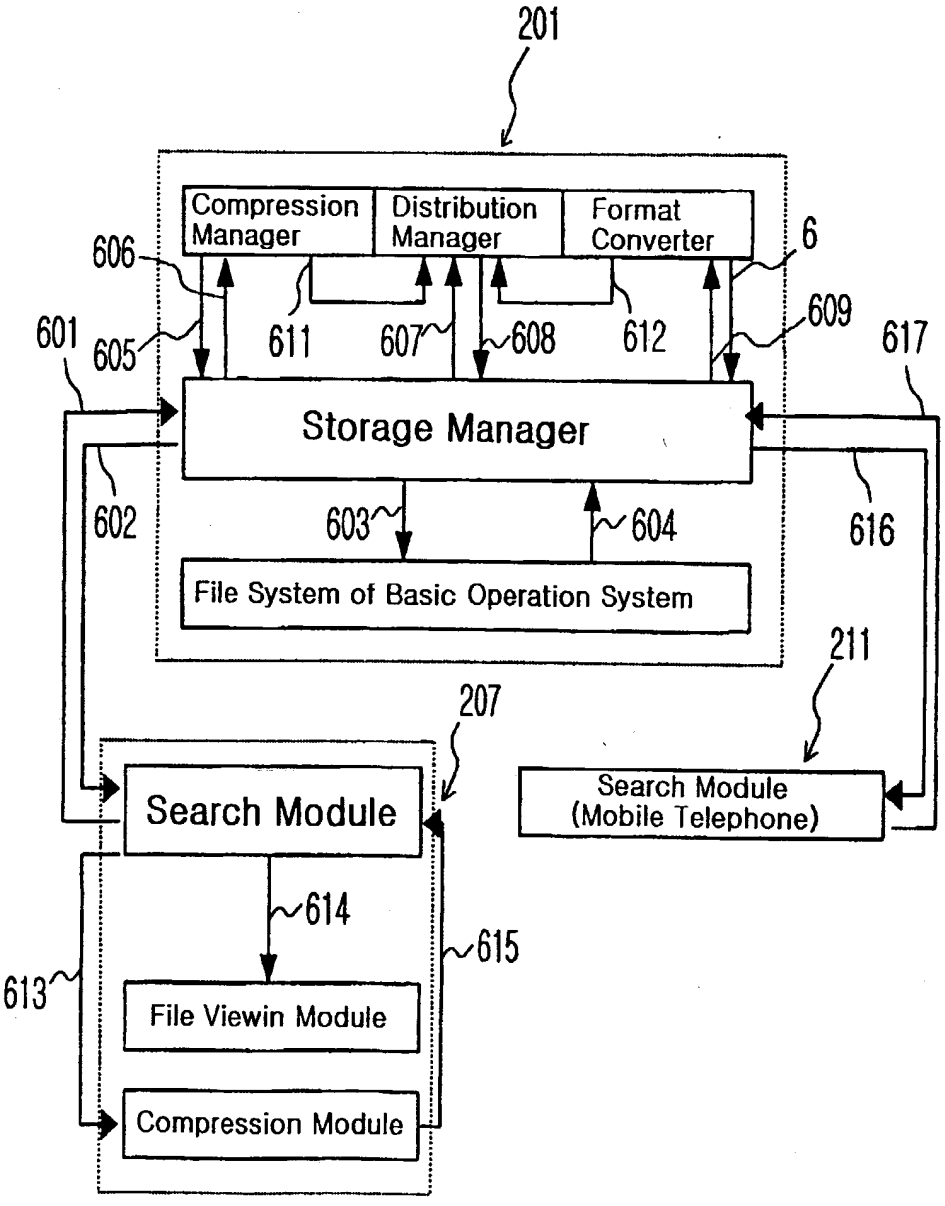
Mobile Docum... C:₩mschang₩... Microsoft Word ... 2000-06-30 p.m. 9:33
mobilebanking.... C:₩mschang₩... Microsoft Power... 2000-09-21 p.m. 5:07
Mobile World C:₩mschang₩... File folder 2000-09-22 p.m. 6:41

Fig. 6


201
Compression Manager
Distribution Manager
Format Converter
6
606
601
605
611
607
608
612
609
617
Storage Manager
602
603
604
616
File System of Basic Operation System
211
207
Search Module
Search Module (Mobile Telephone)
614
615
613
File Viewin Module
Compression Module

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR00/01239

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 H04Q 7/24

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimun documentation searched (classification system followed by classification symbols)

H04Q 7/32, H04Q 7/24, H04Q 7/38, H04Q 7/22

Documentation searched other than minimun documentation to the extent that such documents are included in the fileds searched

Korean Patents and applieeations for inventions since 1975
Japanese Patent and applications for invention since 1975

Electronic data base consulted during the intertnational search (name of data base and, where practicable, search trerms used)

NPS , "mobile internet" etc.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 889,660 A (INTERNATIONAL BUSINESS MACHINES CORPORATION) 07 JANUARY 1999 see claims NO.1, 3-5, 7	1,6-8, 16-20
X	WO 97/33421 A (BELL COMMUNICATIONS RESEARCH) 12 DECEMBER 1997, see claims NO. 21-22, page 26, line 17 - page 28, line 10, page 32 line4- page 40, line 19	1-2, 4-6, 10-15
Y	JP 10-079803 A (NTT) 24 MARCH 1998, see abstract	1-2, 5

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevence; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevence; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
28 FEBRUARY 2001 (28.02.2001)	28 FEBRUARY 2001 (28.02.2001)

Name and mailing address of the ISA/KR
Korean Industrial Property Office
Government Complex-Taejon, Dunsan-dong, So-ku, Taejon
Metropolitan City 302-701, Republic of Korea
Facsimile No. 82-42-472-7140

Authorized officer
BAE, Soon Goo
Telephone No. 82-42-481-5742

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/KR00/01239

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 889 660	07.01.99	JP 11-041643	12.02.99
		KR 99-13393	25.02.99